

REPORT ON THE
PROGRESS OF
VACCINE
INOCULATION
IN
BENGAL

SHOOLBRED

1805



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REPORT
ON THE
PROGRESS
OF
VACCINE INOCULATION
IN
BENGAL,
FROM THE PERIOD OF ITS INTRODUCTION
IN NOVEMBER, 1802,
TO THE END OF THE YEAR 1803:
WITH AN
APPENDIX,
SUBMITTED TO THE
MEDICAL BOARD AT FORT WILLIAM.

—
BY JOHN SHOOLBRED,
SUPERINTENDENT GENERAL OF VACCINE INOCULATION.

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EXTRACT

EXTRACT

*From the Proceedings of HIS EXCELLENCY
THE MOST NOBLE GOVERNOR-GENERAL
IN COUNCIL, in the Public Department,
dated the 3d May, 1804.*

ORDERED, that the Report on the progress of Vaccine Inoculation in Bengal, and in the provinces subject to the immediate authority of this government, from the period of its introduction in November 1802, to the end of the year 1803, submitted to the Medical Board at Fort William, by Mr. John Shoolbred, Superintendent General of Vaccine Inoculation, be published for general information at the expence of the Honorable Company, and that Mr. Shoolbred be desired to superintend the publication.

The Governor-General in Council entertains a just sense of the zeal, diligence, and ability manifested by Mr. Shoolbred, in the discharge of the important duty committed to him as Superintendent General of Vaccine Inoculation. The Report submitted to Government by Mr. Shoolbred affords abundant evidence of the difficulties opposed to the preservation and exten-

sion of the benefits of Dr. Jenner's discovery in this country, as well as of the indefatigable assiduity and public spirit with which every obstacle to the success of the orders of Government has been encountered and surmounted by Mr. Shoolbred, and by his predecessor, Mr. William Russell.

The support and assistance which Mr. Shoolbred has received from the Medical Profession, and from others residing, as well in Calcutta as in the distant provinces, are highly creditable to the Gentlemen whose exertions are noticed in Mr. Shoolbred's Report; and the success with which those laudable and disinterested exertions have already been attended, affords a reasonable ground of expectation, that the invaluable benefits of Dr. Jenner's discovery, will be preserved in perpetuity in these extensive and populous provinces, and that they will in time be disseminated through every part of Asia.

By Command of

His Excellency the Most Noble

The Governor-General in Council,

J. LUMSDEN,

CHIEF SEC. TO THE GOV.

Fort William, the 3d May, 1804.

v

TO JOHN SHOOLBRED, ESQ.

SUPERINTENDENT-GENERAL OF VACCINE INOCULATION.

SIR,

I HAVE the pleasure to transmit to you, by the authority of Government, an extract from the Proceedings of His Excellency the most noble the Governor-General in Council, respecting your Report on the introduction and progress of Vaccine Inoculation in Bengal, and the provinces subject to the immediate authority of this Government.

His Excellency in Council being pleased to Order, that the Report shall be published for general information at the expence of the Company, under your inspection, you are hereby directed by the Medical Board, agreeably to the Orders they have received for this purpose, to superintend the publication.

The manner in which His Excellency in Council has been pleased to express his approbation of your exertions, is in every respect gratifying to the Board, and I have the pleasure to remain,

SIR,

Your most obedient Servant,

FRANCIS BALFOUR,

FIRST MEMBER OF THE MED. BOARD.

FORT WILLIAM,

Medical Board Office, May 10, 1804.

FRANCIS BALFOUR, ESQ. PRESIDENT,

AND

MEMBERS OF THE MEDICAL BOARD.

GENTLEMEN,

I HAVE the pleasure to forward to you a Report on the progress of Vaccine Inoculation in Bengal, and the provinces subject to the immediate authority of this Government, from the time of its introduction here in November, 1802, to the conclusion of last year.

As I am desirous that the Report should exhibit a plain, intelligible, and uninterrupted narrative of the establishment and promotion of Vaccine Inoculation during the above period, I have been obliged to omit many circumstances relative to the disease, with which it is nevertheless desirable that the Board should be acquainted: I have therefore, with the view of preserving uniformity, thrown such circumstances into the form of an Appendix, which is annexed to the Report.

My object, both in the Report and Appendix, has been to condense my materials as much as I thought
was

was consistent with perspicuity; notwithstanding which, they have both extended to a much greater length than I at first expected. The desire of brevity has prevented my inserting copies of Orders and extracts of Letters, which would have increased them ten-fold.* But as these are the principal sources from which many of my observations are drawn, I cannot, in justice to the merits of my able associates in the Vaccine Department, deny myself the pleasure of forwarding to the Board, my Books of Regulations and Correspondence, as the best proof I can offer of the zeal, ability, and industry of the Gentlemen recommended by the Board for the discharge of this important duty.

I have the honor to be, &c.

(Signed)

JOHN SHOOLBRED,

SUPERINTENDENT-GENERAL OF VACCINE INOCULATION.

Calcutta, March 22, 1804.

A TRUE COPY,

FRANCIS BALFOUR.

FORT WILLIAM,

Medical Board Office, April 19, 1804.

* The references to particular letters have been retained in the Report and Appendix, though the letters themselves are not published.

REPORT
ON THE
INTRODUCTION & PROGRESS
OF
VACCINE INOCULATION, IN BENGAL;

BY JOHN SHOOLBRED,

SUPERINTENDENT-GENERAL OF VACCINE INOCULATION.

IN commencing the Report on Vaccine Inoculation, which it is now my duty to lay before the Medical Board, it may not be unimportant, though it is not strictly official, to exhibit a short view of the introduction of the disease into India and Bengal, and to state, in as few words as possible, what has been done towards its permanent establishment in this part of Asia, previously to my appointment as Superintendant General of Vaccine Inoculation.

The year 1798 was the auspicious æra in which the world was first made acquainted with the happy discovery of Dr. Jenner. The practice of Vaccine Inoculation was begun in London in January, 1799, and has ever since been rapidly increasing in Europe, and gradually extending its benefits to every quarter of the globe. The accounts of the new inoculation, published in England, soon reached this country, and excited, as might have been expected, a very lively interest in all the members of the medical profession,
who

who anticipated, with anxiety and pleasure, the acquisition of a discovery which promised an exemption from pain, misery, and premature death, to so large a portion of mankind. Impressed with these animating sentiments, they expressed an earnest desire to obtain possession of the newly-discovered disease. It was soon known, however, that the vaccine virus did not retain its infecting property long enough to permit its being transmitted, in an active state, to any part of India by sea; and that, consequently, our only means of procuring it must be by different stages overland; by Vienna and Constantinople; Bagdad, Bussora, and Bombay.

So early as March, 1801, the Honorable Jonathan Duncan, Governor of Bombay, addressed a letter on this subject to the Right Honorable the Earl of Elgin, British Ambassador at Constantinople, begging that His Lordship would direct a supply of genuine vaccine matter to be forwarded, as soon as possible, by Bagdad and Bussora; where, the virus being renewed on fresh subjects, it might have the better chance of reaching Bombay in a state capable of communicating the infection.

It was not till the September following that Lord Elgin had an opportunity of complying with the request of Mr. Duncan; when, the disease being fully established at Constantinople, and His Lordship having given so eminent a proof of his confidence in the safety

safety and efficacy of the new practice, as to have his own child vaccinated when only seven days old, some matter was forwarded to Bombay. This first supply failed. By persevering, however, in forwarding frequent supplies of the virus on threads, the disease was at length fortunately produced by Dr. James Short, at Bagdad, early in the year 1802. With matter renewed on Dr. Short's patients at Bagdad, Mr. Milne soon succeeded in producing it at Bussora; and finally, after a long and patient perseverance, under the disappointment of innumerable failures, for which the Medical gentlemen at Bombay deserve infinite praise, a successful Inoculation was at length effected by Dr. Scott, on the 14th of June, 1802, on the arm of Anna Dusthall, a healthy child of three years old; a circumstance which it is of importance to state, because from this patient originally emanated the whole of the vaccine virus now in use in India. In tracing the above-mentioned route of the vaccine infection, it deserves to be noticed, that, in two of the stages, the virus preserved its infecting quality longer than it is usually found to do; the distance from Bagdad to Bussora being thirty to thirty-five days journey, and the passage by sea from Bussora to Bombay, not less than three weeks.

The disease being thus secured at Bombay, the virus was soon produced in sufficient abundance to afford supplies to Poona, Surat, Hydrabad, Ceylon, Madras, and many other places on the coast, and in

the Decan. Frequent attempts were at the same time made to convey it from different places to Bengal by means of dried matter, but all of them failed. The zeal and activity, however, of Dr. Anderson, Physician-General at Madras, in promoting whatever is new or useful, soon prompted him to seize a favourable opportunity of putting us in possession of the disease by means of successive inoculations performed on board ship; and on the 17th November, 1802, we had the satisfaction to see his endeavours crowned with success, by the arrival of Charles Norton, a healthy boy about fifteen years of age, born of European parents at Port Jackson, with a genuine vaccine pustule of the sixth day on each arm. From a native child at Madras, Dr. Anderson, on the 10th October, inoculated John Cresswell, a boy thirteen years of age, also born at Port Jackson. This boy was immediately embarked on board the ship Hunter, Captain Anderson, who from him inoculated a female child on the 22d, from her a Malay boy on the 2d November, and from the Malay boy, on the 12th, Charles Norton, who, as above stated, arrived here on the 17th with the disease upon him. From the arm of Norton several children were immediately inoculated, among whom were two of Sir George H. Barlow, one of the late Colonel Dyer, one of Mr Birch, one of Mr. Trail, and one of Mr. Binny; all of whom passing through the disease in the most satisfactory manner, the genuine vaccine infection may from this time be considered as established in Bengal.

This

This important circumstance was announced to His Excellency the most noble the Governor-General in Council, in a letter from John Fleming, Esq. then first Member of the Medical Board, under date the 29th November, 1802 ; in which, amongst other suggestions for the preservation and diffusion of the disease under this Presidency, he recommends that a surgeon of approved skill and assiduity should be appointed to the charge of preserving a constant supply of recent genuine matter, for the use of the metropolis and subordinate stations, as well as to vaccinate the children of such natives as might apply to him ; and to instruct such of the Hindoo and Mahomedan Physicians as might wish to practise Vaccine Inoculation, in the manner of performing the operation, and the symptoms by which they might be enabled to distinguish the genuine disease.

To the useful and important duty here delineated His Excellency the most noble the Governor General in Council was pleased to nominate Mr. William Russell, a gentleman whose abilities and zeal for improvement in every branch of medical science, peculiarly qualified him for such a situation. Mr. Russell, while he continued in office, assiduously kept up the disease, supplied the medical practitioners in Calcutta with matter for the inoculation of their own patients, and transmitted the virus successfully to different parts of the country ; and even to Prince of Wales's Island by sea. In the formation of a new establishment, it

is not easy at once to fall into the best and most regular method of conducting it. This circumstance, together with a serious indisposition with which Mr. Russell was attacked soon after his appointment, and which finally obliged him to go home, prevented the preservation of any record, from which it can be accurately ascertained, what progress the disease made during the first three months, succeeding its introduction into Bengal. From my habits of intercourse and friendship with my intelligent predecessor, I can, however, confidently affirm, that no exertions on his part were wanting to preserve and diffuse, as widely as possible, the benefits of this happy discovery. All the European children in Calcutta and its neighbourhood were speedily vaccinated. The disease was certainly extended to Cawnpore and Futty Ghur, in that direction; to Rungpore, to the Northward; and it may fairly be inferred, to all nearer and intermediate places where the inhabitants were desirous of having it. Enough, in short, was done to make medical men in this part of India pretty generally acquainted with the appearances of the disease from their own observation; and to satisfy anxious and intelligent parents that they had obtained a benign and inoffensive substitute for the most malignant, loathsome, and fatal disease which ever afflicted the human race. More, in so short a time, could scarcely be expected.

Having thus rapidly traced the vaccine disease in its progress from Europe to Bengal, and exhibited, as accurately

curately as the nature of the subject will admit, the early state of it in these provinces, I shall now have the satisfaction of reporting to the Board what has been done towards its preservation and extension, since my own appointment to the office of Superintendent-General of Vaccine Inoculation. In doing this, I hope I shall be excused the liberty of premising a few words, to shew what share, as an individual, I had in the preservation and promotion of Vaccine Inoculation prior to that period.

From the time that the disease was imported into this settlement, and long before it became a point of official duty with me, I had succeeded in keeping it up by a series of successive inoculations performed at the native hospital; and with the concurrence of His Excellency the most noble Patron, and the Governors of that humane institution, had formed a plan for extending its benefits to all who might desire it in Calcutta, as well as to secure a depot of genuine matter under my own eye, for the supply of other places, should it at any time be required. This establishment, which I found eminently useful for both these purposes, afforded me also an excellent opportunity of observing the nature of the disease, of making experiments to prove its efficacy in rendering the constitution unsusceptible of small-pox, and on the best manner of preserving and transmitting it to other places, as will be more particularly specified in the conclusion of this report.

The

The bad state of Mr. Russell's health obliging him to depart for Europe on the 1st of March 1803, His Excellency the most noble the Governor General in Council, was pleased to appoint me, the 16th of the same month, to superintend the promotion of Vaccine Inoculation in his room; and it is from this date that the present report may be considered as assuming, more strictly, the nature and form of an authentic official record.

The Vaccine virus, as has been observed above, had been transmitted by Mr. Russell to many of the civil and military stations, where it was kept up for some time; but when the European children at those stations had been all inoculated, the disease was in most instances lost, from the want of fresh subjects to renew the infection. It continued, I believe, to exist only at the Native Hospital, under my management; and at Dacca, Moorshedabad, and Patna, where Mr. Tutin, Mr. Robinson, and Mr. Macnabb, with the most laudable zeal, had, by means of rewards, and the more extensive population of those cities, managed so, as still to keep up a supply of recent and genuine infection on the living subject. The Medical Board, however, wisely considering that the preservation of the vaccine virus to Bengal, and perhaps to India, was a matter of too much importance to trust to the casual zeal of a few individuals, which might evaporate when the novelty of the thing was over, soon afterwards laid before government the plan of an establishment,

lishment, every way calculated to secure to Bengal, and the provinces under this Presidency, every possible advantage from vaccine inoculation. This plan the most noble the Governor General in Council, with the most humane and liberal views, was pleased to carry into effect on the 5th of May 1803. Subordinate superintendents of vaccine inoculation were appointed at eight different stations; so distributed over the country as to afford the best opportunity of diffusing the benefits of vaccination among the inhabitants; as well as to provide so many depots of infection, to supply each other in case of its accidental loss at any one of them: which subsequent experience has shewn may sometimes happen, notwithstanding every care and precaution to guard against it. As it can scarcely be supposed, however, that so untoward an accident can ever happen at all, or many of the stations, at the same time, the formation of the vaccine establishment, besides its other advantages, may safely be regarded as a certain means of preserving the genuine disease in Bengal. Under each of the Superintendents of Vaccination, a certain number of the civil Surgeons, nearest to each station, were directed to act, in promoting to the utmost of their power, the general views and intention of the establishment, and by this addition of strength, the vaccine department may be said to have been put upon a permanent and effective footing which nothing can exceed.

The utility of the plan here described will be best demonstrated by the following abstract of the proceedings of the several Superintendents of Vaccination:

NUMBER OF PATIENTS VACCINATED

AT THE

PRINCIPAL & SUBORDINATE STATIONS,

UP TO THE END OF LAST YEAR.

<i>Stations.</i>	<i>Superintendents.</i>	<i>Classes.</i>	<i>Total.</i>
Calcutta,	John Shoolbred,	Christians 270 Mahomedans . . . 837 Hindoos 473	1580
Dacca, Moorshedabad, Patna,	William Tutin, James Robertson, James M'Nabb,	Not ascertained. Ditto Christians 30 Mahomedans 229 Hindoos 1366	652 360 1625
Benares, Allahabad,	No Report. A Gibb,	Christians 29 Natives 90	119
Cawnpore, Furruckabad.	Acting P. Ewart, No Report.	Not ascertained.	120
Total at the Vaccine Stations			4456*

Upon

* It would have been easy for the Superintendents of Vaccination to have inoculated a greater number of patients ; but as the principal object with them has hitherto been to establish a sure and permanent system for keeping up the disease, it was more advisable to inoculate a few only at each time, than, by inoculating a greater number, to run the risk of depriving themselves of fresh subjects in the vicinity of their respective stations.

Upon the foregoing abstract it is necessary to remark, for the purpose of explaining why so little has been done at the more distant stations, that the matter having been lost there after its first introduction, it was not possible to restore it in an active state, even so far as Allahabad, before the end of November. Not long after the formation of the vaccine establishment, the matter in use at Patna, from some unaccountable cause, lost its infecting quality, and the inoculation, with it, was consequently for a time suspended. At the same time, the disease was lost at Moorshedabad, owing to three children from whom virus was to have been taken for farther inoculations, having been carried away without Mr. Robertson's knowledge. I soon restored it to that station, but it was not till the end of September, after various failures with matter, both from Calcutta and Moorshedabad, that Mr. M'Nabb succeeded with some matter forwarded by me, in reproducing the disease at Patna. Mr. M'Nabb immediately forwarded matter to Allahabad, with which Mr. Gibb at length succeeded in getting possession of the disease towards the end of November.

At Benares and Furruckabad it does not appear that any person has taken charge of the vaccine duty. I have had no applications for matter from those stations, nor received any answer to letters addressed to them.

Regular Reports have not been received from all the civil surgeons directed to co-operate with the subordinate

nate superintendents of vaccination; but from their applications for matter, and the assurances with which they are accompanied, of doing all in their power to forward the benevolent views of government in this respect, there is reason to believe that, at most of the zillah stations, vaccine inoculation has been carried as far as the natives have been found willing to contribute subjects for keeping it up. It may in this place be remarked, that the whole tribe of Bramin inoculators are, from interested motives, determined enemies of the new practice, and, by their influence over the minds of the people have certainly, in many instances, prevented their bringing forward their children. This obstacle, however, to the more extensive diffusion of the disease will gradually decrease, particularly if the small-pox should happen to break out epidemically at any of the stations where vaccination has been much practised. The natives will then have convincing evidence, that the children who have already been vaccinated are proof against the contagion of this destructive disease, however close their intercourse may be with those who labour under it.

To the above number, furnished by the superintendents of vaccination, I have the satisfaction to add the following, from gentlemen in different parts of the country.

Mr.

Mr. CHARLES TODD, surgeon at Rungpore, vaccinated by himself and the Baieds in his district, up to the middle of last year, no less a number than	2080
Mr. Kegan, at Chuprah	476
Mr. Harper, at Backergunge, by himself and some Bramins	218
Mr. Hunter, at Burdwan, chiefly from the jail..	43
Mr. D. Todd, at Soorool	20
Mr. Patch, at Gya	22
Mr. Julius at Arrah	56
Mr. Barnett, at Bauleah.....	17
Mr. Thomas, Cuttack	7
Dr. Hare, Calcutta	411
Mr. Cheese, Calcutta	291
Mr. Gregory Jackson, agent for loading and unloading Company's ships at Kedgerree ..	16
Mr. Mason, salt agent to the Honorable Company at Tumlook, by himself and his unco-venanted Assistant, chiefly Hindoos.....	553
	<hr/> 4210 <hr/>

I cannot add this great number of patients to the register of vaccination without doing justice to the humane zeal and uncommon industry of Mr. Mason, in conferring the benefits of the new inoculation on so many of the natives in his district. Mr. Mason, very soon after the introduction of the disease, requested me to vaccinate one of his Molungies, from whom, at

the proper time, he took matter for further inoculations, and has ever since kept it up with a few interruptions, arising from the necessity of his being occasionally absent from his station. The reports with which I have been favoured by Mr. Mason, evince an attention to the progress of the disease, and a discrimination of its characteristic appearances, very uncommon in a person not of the medical profession, and not exceeded by any of those who are: and I have met with no one who has formed a juster estimate of the value of the new inoculation to mankind, or who places in a stronger point of view the obstacles which will always exist to prevent the natives of this country from reaping the full benefit of so great a blessing. In one of his letters, Mr. Mason, lamenting this circumstance, expresses himself in the following words:

“The great obstacle to the general diffusion of the vaccine inoculation seems to proceed from the stupidity and apathy of the natives of all ranks and descriptions, which must ever disqualify them as practitioners on whom any reliance can be placed for keeping up the genuine disease; and the utmost exertions of every European in the country, even if all were zealous in the cause, could not extend the blessing to one-tenth of the Company’s vast dominions in the East. This is an obstacle to which I see no possibility of applying any remedy.”

I have

I have the more willingly inserted the above quotation, because it shews, from the testimony of a most respectable, well-informed, and disinterested servant of the Company, the excellence of the plan adopted by Government, at the recommendation of the Medical Board; which, by multiplying the number of European vaccinators in every part of the country, affords, in the greatest possible degree, the only remedy that can be devised against the apathy and incapacity of the natives above noticed by Mr. Mason.

Collecting then the whole of the items in the preceding abstracts, the number vaccinated will appear as under:

At the Vaccine Stations.....	4456
In other parts of the country	4210
At Prince of Wales's Island as hereafter mentioned	1000
Vaccinated, but of whom no return has been made, say	1500
	<hr/>
Total vaccinated up to the 31st Dec. 1803..	<u>11,166</u>

Besides supplying the vaccine stations, as already stated, and promoting the inoculation from thence as far as could be accomplished, we have had the further satisfaction of successfully transmitting virus, or putting it in the fairest train of transmission, to places beyond the seas.

One

One of the first letters which I had occasion to enter in my book of Vaccine Correspondence, was from W. E. Phillips, Esq. temporary Governor of Prince of Wales's Island, under date the 27th of February, 1803, announcing to this Government, that Mr. Waring, senior Medical Gentleman there, had succeeded in producing the disease with matter forwarded by Mr. Russell, after a voyage of twenty-three or twenty-four days : and that at that time they had inoculated about 100 children. I am sorry to observe, however, by a letter received a few days ago from Mr. Heriot, that, after carrying the disease successfully through about a thousand patients, they somehow or other, as he says, unaccountably lost it. It could not be for want of patients, because no prejudices against it exist there, and as the small pox has not been on the Island for several years, there could be no difficulty in finding abundance of subjects susceptible of the infection.

Our next attempt by sea was to transmit the disease to Fort Marlborough, where every trial previously made to introduce it by means of dried matter sent from Madras, had proved abortive. Successive inoculations performed on board ship, was therefore the only way by which we could hope to put Sumatra in possession of what must prove so great a blessing to that Island, where the small pox, when it breaks out among the Malays, rages with such devastating fatality as often to depopulate whole tracts of country.

This

This plan was, under the authority of His Excellency the most noble the Governor-General in Council, carried into effect in December last, by the embarkation, on board the Honorable Company's ship Carmarthen, Captain Dobree, of fourteen children from the lower Orphan School, who had never had the small-pox nor cow-pox. Two of these children having been successfully inoculated before they left town, and having the disease of the sixth day, well characterised in two places in each arm, the others were to be inoculated from them in succession during the voyage. No accounts have yet been received of the arrival of the Carmarthen*; but the measures adopted were such as could hardly fail to succeed in transmitting the disease to Bencoolen on the living subject.

Having accomplished this plan as far as depended on us, with every fair prospect of success, His Excellency the most noble the Governor General expressed a desire that the disease should also be forwarded to Port Jackson; but the voyage to that settlement being not less than seventy or eighty days, and it being impossible at present to procure children to undertake the voyage, in sufficient number to keep up the disease for that length of time, we have been reluctantly obliged to postpone the accomplishment of his Lordship's views till some future period.

The

* See the conclusion of the Appendix.

The same obstacle exists against any proposal for immediately sending the disease to China, of which his Lordship has expressed himself equally desirous.

In the preceding pages I have endeavoured to exhibit, in as concise a form as possible, the history of the introduction, progress, and present state of vaccine inoculation in Bengal, and the provinces immediately depending on the Supreme Government, together with the measures that have been adopted towards its colonization, (if I may be allowed the expression,) in distant settlements. It may perhaps be expected that a greater number of patients should appear in the register of vaccination. But when it is considered, that the natives of this Country, naturally averse to all innovation, have yet no affection for the new practice; that the most authoritative class of them oppose it from interested motives; that the circumstance of its coming originally from the cow, an animal so highly revered by the Hindoos, so far from operating, as was at first expected, in its favor, has directly the contrary effect; and that the great body of the natives, the labouring class, are absolutely so stupid and insensible, as to have no perception of its inestimable value to mankind; I should hope it would still appear, that some benefit has already been derived from it, and that no inconsiderable steps have been taken to insure its permanent residence in this quarter of the globe.

The Bramins, who practise inoculation for the small-pox, acknowledge that they lose about one in two hundred. This is probably stating the proportion of deaths lower than actually happens; but allow it to be correct, and say, that all the above 11,000 patients, instead of being vaccinated, had been inoculated for the small-pox, the number of lives saved would be fifty-five. But suppose, what might equally have happened, that the same number had taken the small-pox in the natural way, the mortality of which in India has been estimated at one in three, then the number of lives saved by vaccination in the course of last year is no less than 3666; besides the incalculable number that must have fallen sacrifices to the spreading of the contagion generated on the bodies of so many small-pox patients. However insensible the native inhabitants may be to so great a blessing, the European part of the community regard it with far different feelings. Inoculation for the small-pox, on children born of European parents in India, is certainly much less favourable here than in Europe. There, one in 300 only dies. Here, I believe I shall not err much, if I say one in sixty or seventy. The great risk which thus attended variolous inoculation, kept families every year in a state of inexpressible trouble and anxiety during the months in which the small-pox prevailed; and the duties of the medical practitioner, during this interval, became of course peculiarly harrassing and laborious.

These are positive advantages, already obtained by the introduction of vaccine inoculation into Bengal, which the intelligent part of society know how to estimate.

What we have to look to in future appears to me to be, not only the continuance of the blessings before enumerated, but the animating prospect of a sure and solid foundation having been laid for its universal diffusion in India, as well as to our Eastern settlements, to Java, China, New South Wales, and even to the numerous islands scattered throughout the Pacific Ocean.

— — — — In contemplating a period so auspicious to the happiness of mankind, and so glorious to the name of Jenner, one cannot help anticipating, that, while an approving Sovereign and an admiring Country do justice to the talents, the wisdom and energy so eminently displayed in the military and political career of our most noble and illustrious Governor General, it will not escape the notice of the philosopher and the philanthropist, that the same distinguished administration was no less conspicuous for the humanity, than for the vigour of its measures ; and that to the encouragement afforded to vaccine inoculation, by his Excellency the most noble Marquis Wellesley, so large a portion of the globe has been indebted for the enjoyment of the inestimable blessings

sings derivable from the greatest discovery that ever was made by man for the benefit of his fellow creatures.

(Signed)

JOHN SHCOLBRED,

SUPERINTENDENT-GENERAL OF VACCINE INOCULATION.

Calcutta, March 22, 1804.

FORT WILLIAM,

Medical Board Office, April 19, 1804.

A TRUE COPY,

FRANCIS BALFOUR.

APPENDIX

TO THE

REPORT ON VACCINE INOCULATION,

PRESENTED TO THE

MEDICAL BOARD,

MARCH 24, 1804.

SECTION I.

OF THE GENUINNESS OF THE VACCINE VIRUS
IN USE IN BENGAL.

IN referring to the preceding Report, it will be seen that every possible care was taken that the vaccine matter forwarded from Europe to India should pass through none but unexceptionable subjects during its journey.

At Bombay, Madras, and Culcutta, the healthiness of the first subjects of vaccination is particularly specified; and that the same attention was paid to this circumstance

circumstance at Vienna, Constantinople, Bagdad, and Bussora, is sufficiently attested by the character of the Medical Gentlemen, to whose lot it fell to be so instrumental in conferring the blessing of vaccination on this quarter of the globe.

When the disease reached Bengal, the appearances which existed on the arm of Norton, on whom it was imported from Madras, and which subsequently took place upon the arms of the European children inoculated immediately from him, corresponded so exactly with the descriptions and figures published in the treatises of Dr. Jenner and Mr. Aikin, that no person who had an opportunity of comparing them, doubted of our having obtained possession of the genuine vaccine disease. In a climate so different from that in which the disease was first discovered, it was nevertheless desirable that it should be put to the ultimate test of purity, by a trial of its power to render the constitution once subjected to it, unsusceptible of the future effects of small-pox contagion, both by inoculation and exposure. This effect of it had been incontestibly proved in England in thousands of instances, but still, as it might be said we know not the effect of it in this climate, an opportunity of making the experiment was anxiously desired. Accordingly, on the 16th of January, 1803, in the presence of Mr. Munro, second Member of the Medical Board, I inoculated with recent fluid variolous matter taken on the spot, three children who had previously passed through the vaccine

cine disease, and three more, with the same matter, only an hour after it had been taken. These inoculations, as was expected, produced nothing like variolous affection. In some there occurred a slight inflammation of three or four days; in others no visible effect followed the insertion of the matter. These experiments I reported to Mr. William Russell, then Superintendent-General of vaccine inoculation; and under the authority of the Medical Board, they were published by him in the Calcutta Gazette, for the information of the public. Similar proofs of the efficacy of vaccination in preventing small-pox, both by inoculation and exposure, were obtained by other Gentlemen in different parts of the country*.

I should have been glad to have repeated these experiments this season, but the judicious prohibition of small-pox inoculation in Calcutta and its neighbourhood by the police, has prevented my being able to obtain a supply of variolous virus for that purpose. It is not, however, a matter of much consequence, because there is not the smallest room for apprehension that the vaccine virus has in our hands suffered any diminution of power. On the contrary, from the uniform and invariable character displayed by the vaccine pustule, through a series of upwards of 1,500 patients inoculated with my own hands, as well as from the concurring evidence of all the subordinate stations

* See Mr. Macnabb's letter No. 44, and Mr. Kegan's No. 45.

stations, I have the most perfect conviction, that the disease we now inoculate possesses, in full force, the prophylactic quality which renders its discovery so inestimable a blessing to mankind. Even in the dark skin of the native of Bengal, the traits of genuine vaccination are sufficiently conspicuous to remove all doubts on the subject; the commencement of vesication on the fourth or fifth day; its gradual increase, circular form, depressed centre, cellular structure, and limpid contents; the surrounding tumefaction, or areola, where the skin is fair enough to shew it; the slight fever on the eighth, ninth, or tenth day; and the subsequent progressive conversion of the vesicle into its peculiar horny, dark brown, glossy scab, dropping off from the fourteenth to the twentieth day, and leaving a permanent pitted cicatrix; are circumstances belonging to no other affection to which the human body is subject; and which, in my opinion, would stamp the vaccine inoculation with the full possession of its specific power, did no opportunity of putting it to the test of experiment ever again occur. The series of appearances above described are, as I have said, sufficiently distinguishable even in the skin of the native. But in Calcutta, from the frequent opportunities that occur of inoculating the children of Europeans, we have the farther satisfaction of seeing the disease pursue its course with still greater conformity to the drawings and descriptions of authors; particularly in the concomitant areola, which, when beginning to fade in the clear skin of a healthy European child,

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may truly be said to be beautiful. This appearance, announcing the completion of constitutional affection, cannot be contemplated without a mixed emotion of exultation and pity, when it is considered that the little train of phenomena just enumerated, which scarcely deserve the name of morbid action, and occasion neither fear, pain, nor anxiety, nor have ever, it is believed, been the cause of the loss of life, is what the world has obtained in exchange for the most loathsome and extensively fatal of all diseases. A disease, which creates an age of fear and anxious trouble to the parent, of indescribable suffering to the child, often occasioning loss of sight, unseemly scars, the entailment of other deadly diseases, and even death itself in one out of five or six; in this country, probably one out of three:—a dreadful expenditure of human life, which small-pox inoculation, though it often saved the individual, is truly believed, not to have lessened in the aggregate.

SECTION II.

OF THE PERMANENCY OF THE VACCINE CHARACTER
IN BENGAL.

IT was suspected by some, that the climate of Bengal, either from its high temperature, or the almost constant prevailing moisture of the atmosphere, might have some effect in weakening the power of vaccine infection; and that the virus might thus gradually lose its quality of communicating the disease from one subject to another. This suspicion it was reasonable enough to entertain, on the first introduction of a new disease into a climate where it had never before been known. I am happy however to observe, that, though there are times at which the disease seems less easily communicated than at others, yet, where the inoculation does at all take effect, it has never, in the course of my experience, failed to exhibit all the essential characters of genuine vaccine.

In the month of July last, when the weather was in a high degree sultry and moist, it was observed that a much greater number of failures happened in inoculating from patient to patient with recent fluid taken at the instant, than had ever before been known. I was then seriously alarmed for the loss of the disease, having by the failure of some, and the destruction of the

the pustule of others, by scratching, been reduced on one of my inoculating days, to a single pustule from which I could obtain matter to keep up the disease. And what added greatly to my fears was, that this untoward occurrence took place just at the time that I had received accounts of its loss, both at Berhampore and Patna, as mentioned in the report, and stated more at length in Mr. Macnabb and Mr. Robertson's letters.*

By repeating my inoculations, however, for some time with two punctures in each arm, the disease soon resumed its former appearance of stability; the virus became more abundant; I was able to restore it to the stations at which it had been lost; and have since had no cause for apprehension on the score of numerous failures.†

I have seen no case of what has been called spurious cow-pox; that is, no anomalous affection at the inoculated part, which could, by a person properly qualified to judge, be taken for the real vaccine disease. I am therefore much disposed, with Dr. Pearson and his coadjutors at the vaccine institution in London, to discard the term *spurious vaccine* altogether, as calculated to convey an erroneous idea of the nature of the disease. For if, in endeavouring to produce the vaccine disease, we inoculate with real or supposed

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vaccine

* Vide Correspondence, No. 11, and No. 15.

† See the conclusion of the Appendix.

vaccine matter, either the *real vaccine* vesicle takes place, or it *does not*. The real disease cannot be mistaken by a person of an experienced eye, and we are no more entitled to call any anomalous local affection which may succeed the insertion of improper matter with a view to cow-pox, *spurious vaccine*, than we should be to call *spurious small-pox*, any similar local affection produced by inoculation with common pus or any other extraneous matter, instead of matter actually variolous. I therefore wish it to be understood, that when in the report or appendix I make use of the term real vaccine, or genuine vaccine, it is only meant, in conformity with more general usage, to express the disease being fully and unequivocally characterised, and not as a term in opposition to spurious.

In thus endeavouring to abolish the term *spurious vaccine*, I would not be understood to mean, that less discernment and circumspection than has been hitherto inculcated are necessary in distinguishing between what is actually the *vaccine disease* and what is *not*. On the contrary, this distinction will always call for the utmost attention on the part of the vaccinator, in order to prevent any anomalous local affection which may follow inoculation, intended to produce the vaccine disease, from passing for that specific action, both local and constitutional, which alone has the power of rendering the human body unsusceptible to the future effects of small-pox contagion.

It was supposed by Dr. Jenner, that matter taken at a late period was apt to produce what was called by him spurious vaccine; and he accordingly published a caution against taking matter for inoculation after the areola, or efflorescence, was formed. This, however, seems to be unnecessary; for though it is very certain that matter taken after the ninth day, when the disease has observed its usual progress, fails more frequently than that which is taken at an earlier period, yet when the inoculation does at all succeed, ample experience has shewn, that no difference whatever exists in the kind or degree of the disease. The matter commonly used by me, and at the other vaccine stations, is that of the eighth day; but when, either from scarcity of matter, or for the sake of experiment, that of the eleventh or twelfth has been used, no difference has been observed, except its more frequent failure. On this account alone, however, it ought to be avoided when matter of an earlier day can be had. This abatement in the activity of the vaccine matter at a late period appears to be well accounted for by Dr. Pearson, from whose last report of the vaccine institution in London, I beg leave to copy the following passage:

“ We submit to the determination of others, an hypothetical explanation of the matter of the vaccine pock growing after the ninth or tenth day gradually less and less efficacious. The inoculated matter, in the first place, produces its own specific stimulation,
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by which fluid matter is secreted in a vesicular eruption; which matter is impregnated with the vaccine poison. This secretion continues till a part of it is absorbed, and that change is thereby effected in the whole constitution, by which it is rendered incapable of being acted upon in a similar way in future, either by the vaccine, or variolous poison. From the moment of this constitutional change, the peculiar vaccine secretion ceases, and mere secretion of serous fluid, or at least not vaccine, goes on, from the irritation simply of the fluid already collected. Hence, such serous fluid altering the vaccine poison, or this vaccine poison being absorbed, the pock affords matter, frequently, of little or no efficacy after the twelfth or fourteenth day. That no pus is secreted in general, can only be imputed to the nature of the vaccine poison itself not stimulating, as the variolous does, usually about the eighth day, to produce pus; but in place of so doing, the limpid fluid becomes thickened, either by the absorption of the thinner parts into a scab, or by combination with oxygen. The secretion itself, and the inflammation, gradually cease, from the excitability which affords the inflammatory action, and secretion being exhausted."

SECTION III.

OF THE MEANS OF KEEPING UP THE VACCINE DISEASE.

WHEN we look back to the delays and difficulties which attended the transportation of the vaccine virus from Europe to Asia, and duly consider the great benefit already derived from its introduction into India, as well as the still greater blessings which may hereafter be confidently expected from it, the means of guarding against the loss of the disease to this part of the world becomes a matter of the most important enquiry.

When the knowledge of the vaccine disease was first communicated to the world, by Dr. Jenner, two circumstances, respecting its effects upon the human body, chiefly surprised medical men, and excited a degree of incredulity in the minds of many, otherwise well disposed to give credit to the author of the discovery for the truth of his grand proposition. It was said that the vaccine disease, while it possessed the inestimable quality of rendering the human constitution once subjected to it, proof against the subsequent effects of small-pox contagion, in whatever manner applied, was nevertheless, capable of being itself repeatedly and indefinitely received by the same individual; and that it could also be repeatedly and indefinitely

indefinitely received by a person who had already undergone the small-pox. These two alledged facts, as they differed so widely from the law of analogy observed in other morbid poisons, and particularly in that of small-pox, which the new disease was then erroneously said very much to resemble, were received by medical philosophers with becoming diffidence and hesitation. Some opposed the new inoculation from a belief that it would be unwarrantable to exchange a disease to which mankind were subject only once in their lives, for one which might be received an indefinite number of times ; not reflecting that the vaccine disease, not being communicable otherwise than by inoculation, annulled this objection. Others considered the hands of medicine as strengthened by the alleged fact, and speculated upon the cure of other diseases, where a fresh excitement might be wanted, by the introduction, at will, of a harmless vaccine fever. Another very important practical deduction, and which is the immediate business of our present enquiry, also depended on the decision which experience might pronounce on the truth or fallacy of the facts above mentioned. If they were true, it is evident that we should never be at a loss for the means of preserving the disease on the living subject, because those who had already been vaccinated, as well as those who had had the small pox, being equally capable of receiving the disease, might, consequently, be employed for conveying it by successive inoculations to any given distance.

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When the disease was first introduced into Bengal, the facts alluded to, though doubted by many, had not been formally disproved by any publication that had come to my hands ; and I believe are, even at this day, held to be true by some practitioners in England. I therefore availed myself of the earliest opportunities that offered of trying what would be the effect of re-inoculating, with fresh vaccine matter, subjects who had once undergone the disease ; and also those who had already had the small-pox. As the detail of some of these experiments were communicated to the Board, and under the sanction of the Board to the public, through the channel of the Calcutta Gazette, it is needless here to say more, than that in no one instance did I succeed in producing the disease a second time, in a person once duly vaccinated, or in one who had previously undergone the small-pox. I was therefore fully assured, by my own experience, that in neither of these ways was there any hope of keeping up the disease on the living subject. Mr. Robertson made similar experiments at Moorshedabad, and with the same result *.

In the conclusion drawn from these experiments, I have since had the satisfaction of being confirmed by Dr. Pearson, who states the result of his experience at the vaccine institution, in the form of the two following propositions : “ Proposition X. Persons who have already gone through the vaccine, are unsusceptible

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* Vide Correspondence, No. 3.

tible of it a second time.” “ Proposition XI. Persons who have undergone the small-pox, cannot be infected so as to produce the cow-pock.”—And after stating the manner in which these facts were ascertained similar to our own experiments, this intelligent, indefatigable, and most zealous promoter of vaccine inoculation, makes, in a note, the following judicious remarks, on the causes which occasioned a different opinion to be held in the early period of our acquaintance with the disease.

“The ground for the opinion that persons who have gone through the small-pox are still susceptible of the vaccina, as well as those who have already undergone the vaccina, is still maintained by a few partizans. The sources of this error we think may be satisfactorily demonstrated in the present improved state of the history of the vaccina :—1st, The characters of the cow-pock were not known even to the first promulgators of the vaccine inoculation, for want of sufficient experience, and thence, an eruption of the inoculated part, in reality *not a vaccine one*, was mistaken for *a vaccine one*. 2d, The vaccina, as above stated, very often occurs without any perceivable disorder of the whole constitution. 3d, As a pimple or eruption can be excited, in a small proportion of subjects by variolous matter, in the part inoculated, in a person who has already gone through the small-pox, (the matter of which eruption it is attested can excite the small-pox both constitutionally and locally in others) so the vaccine

cine matter, in a small proportion of subjects, can excite a pimple or eruption, which may be mistaken for the real vaccine-pock; the matter of which *may perhaps*, excite the vaccina in others, both constitutionally and locally. Nay, an affection of the axillary glands, and some fever may even be excited in such cases of inoculation of vaccine and variolous matter, so that it is only by a knowledge of the properties of the vaccine pock, and especially by its progress or course, that such eruptions can be distinguished from the vaccine pock. 4th, In the small-pox, there is almost always both perceivable fever, and on the body, eruptions; notwithstanding, it is not allowed that there is evidence that this disorder can be excited more than once: but of these criteria the fever is very often wanting, and the eruption, almost always in the vaccina.

“Here we should consider,—1st, The rarity of the cases of local affection on inoculation, or such as at all resemble the cow-pock, in persons who have had either the small-pox or cow-pox. 2d, The equivocal properties of such local affections. 3d, That in particular, they are certainly essentially different in their course, duration, and scab, from the vaccine ones.”

It does, however, appear from Mr. Ring's treatise on the cow-pox, that on some persons who have previously had the small-pox, a vaccine pustule has been produced, the fluid of which has communicated the

disease to others. We are therefore not warranted in saying that such a thing never happens ; but only that it happens too seldom to afford any reasonable prospect of keeping up the virus in that way.

Having thus ascertained that persons previously vaccinated, or who have already had the small-pox, cannot be depended on for preserving the disease, the next most promising mode that presented itself was, to try whether it might not be kept upon the cow, the animal to which we are originally indebted for so great a blessing.

In my letter to the Board of the 9th of February 1803, above referred to, I mentioned, that, with matter from the human subject, I had succeeded in producing the disease in the cow, and in taking it from the inoculated cow back to the human subject. Dr. Sacco has given an account, and the only drawings which have been published, of the casual cow-pox, as he found it on the Milanese cows.* But it did not then appear, from any of the books which I had seen on the subject, that any person had taken the trouble to inoculate the cow purposely with vaccine matter ; and to make us acquainted with the result of such experiment.

Mr.

* Medical and Physical Journal; vol. VII, and Philosophical Magazine, vol. XII.

Mr. Ring's treatise, which has since fallen into my hands, informs us, however, that professor Colman inoculated a cow from the human subject, and that she took the disease; but the object of the experiment was simply to ascertain the susceptibility of the animal to a morbid poison generated in the human body, and we have no further account of it, than that such susceptibility did actually exist. The vaccine committee at Rheims made the same experiment; and even restored the disease to the human subject with matter produced by the cow; but they also have omitted to give us any account of the appearances of the inoculated parts in the animal.

Without meaning, therefore, to assume to myself the smallest credit for the performance of an experiment so obvious to conception, and so easy in execution, I shall content myself with merely stating what the appearances of the inoculated disease were in the cow; and what the consequence of subsequent inoculations with the matter so produced.

On the 28th January, 1803, I inoculated a milch cow, by two punctures on each of the teats of the right side, with recent fluid vaccine matter of the seventh day, taken at the instant of using it, leaving the other two teats to milk her by. For the first four days nothing appeared but the marks of the punctures. On the fifth day, a small circular tumor was observable round each of the punctures. These tumors increased,
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and on the eighth day were from a quarter to half an inch in diameter; circular in form, surrounded with a slight inflammation, and in the center beginning to be converted into a flat smooth brown scab. The form of the tumor, and the appearance of the scab altogether, resembled the inoculated pustule on the human subject; but instead of being vesicular, and containing a fluid which exuded on being punctured, it had more the appearance of an elevation of the substance of the teat itself, of a spongy texture, from which a thin limpid fluid, resembling genuine vaccine matter, was to be obtained, only by pushing the point of a lancet under the scab. What general derangement the cow suffered in consequence of this local affection I cannot say, the only one which appeared to me being the loss of her milk; and whether that was owing to its not being secreted, or to the omission of milking, which her restiveness under the operation occasioned to be discontinued, I am uncertain. After the eighth day the whole of the tumor was gradually converted into a scab, in form, colour, and consistence, very much resembling the vaccine one in the human subject, which by the twelfth or fourteenth day, fell off, leaving the skin whole underneath, with a pit or cicatrix; in this circumstance, differing widely from the vesicles of the casual cow-pox, which are said to eat deep into the flesh of the teats. Upon the whole, the tumors above described bore a great likeness to the vesicles and scabs represented in Dr. Sacco's drawings; though those which I saw were certainly not vesicles, but, as I have said,

said, a kind of spongy elevation of the substance of the teat, and not unlike that kind of tumor which takes place upon applying a thimble exhausted of air on any fleshy part of the body.

On the eighth day of these appearances on the teats of the cow, I took some of the limpid fluid from below the scab, and with it inoculated a child, on whom, at the proper time, the vaccine disease appeared so satisfactorily, that I took matter from him with which I continued to produce it indefinitely. This I considered as a great step towards the preservation of the virus in case of deficiency of patients. One circumstance only occasioned any doubt in my mind. The lancet with which I took the matter from the cow had been previously used in vaccine inoculation, and though it had been cleaned as much as lancets ever are after using them, it was just possible that enough of the fluid from the human subject might have remained on it to communicate the disease without acquiring any fresh infecting quality from the cow.

To remove all doubt on the fact, I therefore inoculated another cow, and from her, with a lancet which had never been used before, I communicated the disease to a second child, who also supplied me abundantly with genuine matter for farther inoculations. I now considered the cow as almost a certain resource against the loss of the disease; but farther trials proved that I was too sanguine in my deductions. The
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third cow which I inoculated did not take the disease, though the inoculation was performed twice with unquestionable matter. The fourth failed once, but took it the second time. And being now desirous of trying whether I could pass the disease through a series of cows; I from the last inoculated a fifth cow, and two other children. On the children it failed, but on the teats of the cow it produced the tumors already described. This seemed to be another important step, but how great was my disappointment to find that five children susceptible of the disease all failed to take it from inoculation with matter of the eighth day produced by the cow, the second in the series; and that four others inoculated with that of the ninth day, also shewed no appearance of infection. I re-instituted the experiment upon a sixth and seventh cow, with no better success. And now, finding that my experiments were fruitless, troublesome, and expensive; (for by a convenient kind of logic, my Bramins made it out that my cows were now fit for nothing but to be made a present to my servants, (I at length desisted from a farther prosecution of the subject. I should apologize to the Board for taking up so much of its time with the detail of these experiments; but besides being new, as I then believed them to be, I consider it of some importance to shew that the expedient of recurring to the cow, in deficiency of human subjects, however obvious to be thought of, and plausible to recommend, is by no means a resource on which any reliance can be placed for keeping up the vaccine disease.

ease. As far as my experience at present goes, then, I should say, that, as a *dernier ressort*, the vaccine virus may possibly be kept up for a week by inoculating a single cow, but not for a longer time, through a series of cows, and then taken back to the human subject. I do not however mean to deny, that by more frequent trials one might even succeed in passing it through two, three, or more cows in succession, and then take it back to man; but merèly, that the chance of success is so small, as not to entitle the experiment to any consideration as one of the means of keeping up the disease.

The only expedient therefore left for preserving this grand prophylactic to India, where, as will be shewn presently, the disease is not known to exist casually among cattle, is that of inoculating in succession a sufficient number of fresh human subjects who have never before had the small-pox or cow-pox. For the accomplishment of this important purpose, a more judicious and excellent system could not have been contrived, than that which is stated in the report to have been organized under the authority of the Governor General in Council, on the recommendation of the Medical Board; it being nearly impossible that the vaccine virus should, all at once, fail in the hands of so many men, experienced in its nature, and competent to its management, otherwise than by an absolute refusal on the part of the natives to suffer inoculation,

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or by some unforeseen change in the quality of the matter, which, from its having already sustained all the changes of temperature incident to this climate, there does not now seem much reason to apprehend.*

• See Postscript to the Appendix.

SECTION IV.

OF THE DIFFERENT METHODS OF TRANSMITTING
VACCINE MATTER FROM PLACE TO PLACE.

OF the three methods principally in use for transmitting vaccine matter to a distance, viz. the armed lancet, the impregnated thread, and the glass plates charged with matter on their contiguous surfaces, our experience gives the preference to the last. After puncturing a vaccine pustule of the seventh or eighth day, in five or six different places, so as to allow its contents to exude, I press down upon it two plates of glass about an inch square. When the matter thus received upon the plates becomes dry in the shade, I apply their charged surfaces to each other, and retain them in close contact by means of softened candle wax, the heat of melted sealing wax having been thought to injure the matter. When it is to be used, the dried virus is scraped up with the point of a good lancet, carrying a very small particle of cold water, and inserted into each arm, or, for greater security, into two places in each arm, as in inoculating for the small-pox.

By this method the virus is frequently carried in an active state to considerable distances ; though it must be confessed that, in this and every other way, it is very apt to fail when once dried ; and the greater the
heat

heat of the weather, the more liable it is to lose its infecting quality. This diminished power of the virus is so remarkable in the hot months, that I have been often disappointed in attempting to carry it from one house to another, though it may not have been dried on the lancet for more than an hour. To avoid these frequent mortifications, it is now my general practice to carry a child with me in the eighth day of the disease, wherever I have private patients to inoculate at their own houses.

Though in general the plates of glass seem to be more successful than threads, I must not omit to mention, that it was by threads that the virus has performed its longest stages in this country, viz. from Bagdad to Bussora, Bussora to Bombay, and Calcutta to Prince of Wales's Island.

When matter is sent on a lancet, it soon oxidates the point, and becomes inert. To obviate this inconvenience, Dr. Pearson contrived a lancet of platina, which does not rust; and Dr. De Carro, one of ivory with the same view. Dr. Jenner, with still greater simplicity, has lately proposed a strong and sharp thorn as an instrument well adapted for this purpose. I have just begun to try the effect of this suggestion, by using the thorns of a tree called Botch in Bengalese, and some species of Mimosa and Opuntia, which I have obtained from the botanical garden; but my trials have not been made long enough to enable me to decide

decide upon the merits of the proposal. In using the thorn, I first made a puncture with a clean lancet, into which introducing the point of the armed thorn, I twirl it about so as to allow the matter to be moistened by the slight exudation of blood. By this means it is detached from the thorn, and left under the cuticle, where it is retained as by a valve. A quill cut small at the point, or a sharp ivory tooth-pick, may be used with the same intention.

Dr. Pearson's method of preserving it in hydrogen gas cannot be conveniently practised here, for want of a proper apparatus for procuring the gas, and of phials calculated to retain it when made.

A method proposed by Doctor De Carro, and said by him to be "infallible, and precisely as easy for him who receives the virus as if he had to take it from a fresh pustule," escaped my notice till I began to write this article. This method consists in laying a small piece of *charpie* or lint upon a ripe vaccine pustule, previously opened by several punctures, so that it may fully charge itself with the fluid that exudes; the lint is then to be conveyed with the point of a pin or lancet into a little cavity made for it in a plate of glass. This plate is to be immediately covered with another of the same size with a plain surface, to be well tied up, and then dipt in a solution of sealing-wax in spirit of wine, which completely excluding the air, no evaporation can take place, and the virus can
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be sent to any distance, and kept fluid for any length of time. "I have myself," he adds, used some coming from Hanover, and from Milan, which arrived as fresh at Vienna, as when it was put between the glasses." This seems a very promising method of preserving the virus. I regret that it has so long escaped me, but I am now getting glasses prepared, with which I shall give it a fair and extensive trial.

Another, and apparently a still better method of preserving the virus, is proposed by Mr. Giraud, in the *Medical and Physical Journal* for May, 1803, which has just come to my hands. This method consists in using a small glass bulb with a shank or tube to it of two to four inches in length. He first punctures a plump vaccine pustule, from which in a few seconds a small drop of matter exudes, he then dips his bulb into a cup of boiling water, which expels the air; when, instantly applying the orifice of the tube to the pustule, the matter is gradually drawn up into it as the bulb cools, and the tube is then immediately sealed hermetically, by holding the end of it in the flame of a candle. "To make use of the matter thus preserved, the extreme end of the tube must be broken, and the point of a lancet applied to it; at the same time, by gently approaching the bulb to the flame of a candle, the matter will, by the expansion of the air, be driven out and received on the point of the lancet. Or a puncture may be made on the arm, into which the end of the

the tube may be inserted, and then the candle gently applied to the bulb."

I am afraid it will not be possible to get any such tubes made in this country, but the proposal is so ingenious and so promising of success, that I shall make a point of having a supply of them sent out from England by the first opportunity; and in the mean time will try how near an approach we may be able to make to the construction of them in Calcutta.

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SECTION V.

WHETHER THE VACCINE DISEASE EXISTS AMONG CATTLE IN INDIA; AND OF THE ALLEDGED PREVIOUS KNOWLEDGE AND PRACTICE OF VACCINE INOCULATION BY THE BRAMINS.

THE account given in the preceding report of the formation of the vaccine establishment is a full demonstration, that every possible care has been taken by a wise and benevolent government, for perpetuating the blessings of vaccine inoculation to this quarter of the globe. Under such a system, it is the next thing to impossible that the virus should ever be lost to India; nevertheless, as such an accident is just within the range of possibility, it would in the event of so unexpected a disaster as the total loss of the virus now in use, be a matter of great comfort to be assured, that the disease was to be found among cattle in some particular district of the extensive regions of Hindostan, now under the dominion of the British government or its allies; and that on such an emergency we might, consequently, have certain recourse to the cows of such district for the renewal of our stock of infection.

The disease is known to exist casually in cows, not only in Gloucestershire, from whence the knowledge of its invaluable quality was first promulgated, but in other counties of England and Scotland; in Ireland, Holstein,

Holstein, Lombardy, Macedonia, and perhaps many other parts of Europe. It was therefore not an unpromising field of research, to endeavour to discover it also in India. With a view to facilitate the acquisition of this piece of information, and some other particulars regarding vaccination, I inserted in the Calcutta Gazette of the 7th July, 1803, a series of queries, hoping that the answers I might receive to them would either explicitly settle the point in question, or lead to farther enquires with better prospect of success. My queries were addressed, not to medical men only, but to all who felt interested in the introduction of vaccine inoculation, and who, from their residence in particular parts of the country, and their knowledge of the manners and practices of the natives, might be supposed capable of throwing any light on the subject. The query which related to this particular point was proposed in the following terms.

“ Query 8. Have you any authentic information that the disease called cow-pox, as characterised by Dr. Jenner and other late writers, exists among cows in any part of India? Or, that the practice of transferring the disease from the cow to the human subject, and subsequently from human subject to human subject, for the purpose of preventing the small-pox, was ever adopted in any part of the country; or, that the fact, that a certain matter originating in the teats or udder of the cow possessed such a power, was ever known by the Bramins, or any other class of natives,

previously to the promulgation of Dr. Jenner's discovery?"

Now, as the Calcutta Gazette is a paper which falls into the hands of almost every European in the country, and as the queries were repeated by several of the other weekly journals, it will be readily admitted, I hope, that such an address to the public was the most likely way of drawing forth any information that might be possessed by individuals on so curious and interesting a subjects. The answers to my queries were not so numerous as might have been expected. Several gentlemen, however, did take the trouble to answer them at considerable length; but I am sorry to say, that their communications are all completely destitute of any satisfactory proof of the existence of the vaccine disease among cows in any part of India. Some of them do mention an eruptive disease of cows, which the natives, in common with other eruptive diseases, distinguish by the general name of *gootee*, and which proves fatal to many of them. This is obviously not the disease in question, which, though troublesome in a dairy, under the idea of impurity, and from its infecting quality, is never known to kill the cow. What would be the effect of inoculating the human subject with the product of a disease which kills the brute, it is impossible *à priori* to say. The experiment, I think, is by no means desirable; though I cannot help mentioning, that it had a very narrow escape of being tried,

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about the time the real vaccine disease was first imported into Bengal.

With respect to the other branch of the question, whether the Bramins have now, or ever had, any knowledge of the disease and its properties; it may be remarked, that when the vaccine inoculation first became the subject of conversation in this country, it suffered the fate of other new discoveries. When the proofs in its favour became too numerous and too imperious to allow its prophylactic power to be any longer doubted, it was then by many found out not to be new. Those who will have it that the Bramins know every thing, admitted indeed that it might be new in Europe; but asserted that the Bramin inoculators of this country had been acquainted with it from time immemorial; and that to their frequent practice of it was to be ascribed their singular success in *small-pox inoculation* *. This assertion, however, we are now well assured, was founded in complete ignorance of the specific nature of both diseases, which it is well known cannot by any contrivance be inoculated in such a way as that one shall pass for the other. A circumstance, however, took place not long after our obtaining possession of the disease, which did seem at first sight to countenance the opinion above maintained;

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* That even this boasted success is nothing extraordinary—Vide Report, p. 19.

tained ; and which I consider it my duty here to state in a fair and candid manner.

Mr. Gillman, surgeon to the 8th Regiment Native Infantry, stationed at Bareilly, making enquiries on this subject, got possession of a Shanscrit manuscript, which was said to contain an account of the inoculation with matter originating in the cow, for the purpose of destroying the susceptibility to small-pox. This manuscript Mr. Gillman sent down to Mr Munro at Calcutta, in April last, by whom it was submitted to the perusal of a gentleman of distinguished eminence in Shanscrit literature, who gives the following account and translation of it:

“ The leaves sent by Mr. Gillman contain an extract from a work entitled *Sud’hasangraha*, composed by a physician named *Mahádéva*, under the patronage of *Rájá Rájã sinha*. This extract contains a chapter on the *Masúricá*, (in Hindi called *Masuria*, or *Ma-sooríá*,) which is, I believe, a sort of chicken-pox. Towards the end, the author seems to have introduced other topics ; and immediately after directing leeches to be applied to bad sores, he proceeds thus:

“ Taking the matter (*pùya*) of pimples (*granthi*,) which are naturally produced on the udders of cows, carefully preserve it ; and, before the breaking out of the small-pox (*sitala*,) making, with a small instrument, a small puncture, (like that made by a gnat,)

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in a child's limb, introduce into the blood as much of that matter, as is measured by the fourth part of a *Racti*; thus the wise physician renders the child secure from the breaking out of the small-pox."

"If this passage," says the translator, "has not been interpolated by the *Hindoo* physician, who communicated it to Mr. Gillman, vaccination must have been known to the *Hindus* before Dr. Jenner discovered it. Other copies of the same work should be sought for and examined, to determine whether the passage be genuine."

The passage above quoted looks extremely suspicious, not only from the original having been produced in a part of the country where even inoculation for small-pox is almost unknown, but from the manner of introducing the matter, being that which is used by European practitioners only, and not like that of the inoculating Bramins in Bengal, the only part of the country where small-pox inoculation is much practised. These circumstances alone were sufficient to create a distrust as to the authenticity of the extract. Other copies of the book were therefore sought for, and luckily procured. The Sanscrit word *Sud'hasangraha* signifies, it seems, a collection or *recueil* of detached portions of information on different subjects, collected from authors, or verbal communications, as it may happen; similar, it may be supposed, to what our receipt books, handmaids to the arts, &c. were, before the

the different heads of science and art were methodised and digested into regular Encyclopædias. When the extract in question was collated with other copies of the *Sud'hasangraha* procured in Bengal, nothing of the passage relating to vaccination was to be found in the latter, and I accordingly obtained from Mr. Blaquiere, a gentleman perfectly competent to form a correct judgment on the subject, the following statement of the impression he received from the collation of the two manuscripts.

“ I found the manuscript you sent me agree nearly word for word with a chapter of the *Vanga Sena Chicitsa Meharnava*, until the mention of the vaccination. The conclusion I formed was, that the manuscript was thus far a copy of the said chapter, and all beyond it, on the subject of vaccination, interpolation. It is much to be lamented that such a blessing was not introduced into this country under some other name.”

The *Vanga Sena Chicitsa Meharnava*, mentioned above, is a chapter of the *Sud'hasangraha*, expressly on the subject of medicine, in which it may fairly be concluded the vaccine disease would have been noticed, if noticed at all. Mr. Forster and Mr. Bentley, two other gentlemen well acquainted with the Hindoo literature, also collated the manuscripts, with the same result as Mr. Blaquiere; and I have their farther authority for saying, that they have examined the two most ancient and most esteemed Shanscrit books, composed
professedly

professedly on the subject of Nosology, called the Needan and Churruck, without being able to discover the slightest trace of a previous knowledge of the vaccine disease among the Hindoos, though they both treat largely of the small-pox under the name of *Bussunt* and *Sitala*.

From the above respectable testimonies, it can scarcely, I think, be doubted, that the extract forwarded by Mr. Gillman, is an impudent forgery interpolated into a Shanscrit book, by one of those frauds so commonly and so dextrously committed by the Hindoo literati, for the purpose of supporting the claims of the Bramins to the prior possession of all kinds of science.

Though I have not succeeded in discovering the cow-pox to exist indigenously in any part of Hindostan, I do not pretend that it may not at some future period be found among the cows of this country; and for the reasons before-mentioned, I should consider it a very happy circumstance if such discovery were made. But, independently of the detection of the imposition attempted to be put upon us by the forged Shanscrit manuscript, we now, I think, possess sufficient knowledge of the disease, of the disposition of the people towards it, and of the circumstances necessary for preserving the virus, to be assured that the Bramins never knew the practice of vaccine inoculation, and that, if they had received such a *boon* from
heaven,

heaven, the chance is very much against their being able to keep up the disease for a single inoculating season. But allowing that they had succeeded so far, they must inevitably have lost it during the eight or nine months in the year in which they never practise inoculation. Besides, small-pox inoculation by the natives is a very partial practice in India, being confined almost entirely to Bengal; where the vaccine could not have been known, because the Bengalese inoculators, so far from professing any anterior knowledge of it, make a stand against its introduction now, for the very reason that it does come from the cow, which they could not with any pretence of consistency do, and at the same time maintain a claim to priority of discovery. This is what Mr. Blaquiere alludes to, in lamenting that so great a blessing had not been introduced into India, under some other name than that of cow-pox.

All the flattering hopes which were indulged by physicians and philanthropists both in Europe and in this country, of the eager adoption of the vaccine inoculation by the Hindoos in consequence of their veneration for the cow, have, I am sorry to say, proved completely fallacious. The assertions of my inoculating Bramins; conversation with many of the better informed Hindoos in Calcutta; and the letters of many of my correspondents in different parts of the country, all concur in representing this as a very strong objection, whether real or pretended, to the
general

general adoption of the new practice. This adverse fact in the history of the progress of vaccine inoculation has not, I observe, yet reached England ; on the contrary, a very late medical periodical work, speaking of Dr. Jenner, and his correspondents, says “ From Bengal, he also learns, that the Hindoos receive it with the greatest ardor, from the veneration these people pay to the cow, as well as from the security they find in it from the small-pox.*

SINCE writing the above, a paper has come into my hands, containing something both for and against the probability of the vaccine disease being known in India, which I shall therefore beg leave here to insert.

“ An old Bramin of Barrasset, very well learned, looked over several Shanscrit books, but he could not find that the disorder called *Gow Bussunt*, or cow small-pox, was capable of being communicated ; nor could he find that any of the *Dhumunturries* ever considered it to have been applicable to the prevention of small-pox.

“ The doctors and all old men of Bowannypore say, that they never heard such a thing in their lives. Two

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* Medical and Physical Journal for July 1803.

of the doctors carefully looked over the *great* medical book, called *Neydan*, but they could not find any where, that it was ever considered by any of the *Chickutchucks* in former times as capable of being communicated to the human subject.

“ A farmer, about fifty years old, residing in the district of Burdwan, says, that about fifteen years ago all his cows and bullocks were affected with this disorder, and they all died, except one of the cows who had the disorder on the teats only ; when a Doctor of Bisnopore, having heard that all his cows and bullocks were dying by the *gow bussunt*, came to his house, and after living three days at his house (until the disorder on the teats was ripened) he took the *peebe* out of the *gow bussunt* on a little bit of cotton, saying, that he would inoculate a child of a great man with it, as it would not put him into the danger of the small-pox, but a very strong fever for three days, and thereby he would be freed from the danger of the small-pox while he would live.”

It is more than probable, I think, that the above account, as well as the forged manuscript, was suggested by the questions of the person who made the enquiry. However, as it is the only alledged fact of the kind that has come to my knowledge with any semblance of probability, I shall not fail to prosecute the investigation farther in the district in which it is said to have happened, and at a future period communicate

nicate to the Board the result of my enquiries. I must also beg leave to reserve for a subsequent communication, any information I may be able to obtain respecting the existence of the disease called *grease*, among the horses in India. I have asked many persons in Calcutta, conversant with the veterinary art, either professionally or as amateurs, whether they had ever seen the *grease* in this country; to which they have all answered in the negative.

The origin of morbid poisons is a subject involved in very great obscurity. No circumstance relating to the vaccine disease was less believed at first than the theory of the great discoverer, ascribing its origin to the *grease* of horses heels. It was strongly reasoned against, from the circumstance of the vaccine being known in Ireland, where the same persons are not employed in dressing the horses and in milking the cows; and many experiments were made to convey it from the horse to the cow by direct inoculation, without success. At length, however, Dr. Loy did succeed in producing the true vaccine disease in the human subject, from the grease of horses, both with and without the intervention of the cow. Dr. Loy's experiments are admitted in their fullest extent by Dr. De Carro, while by others they are thought to require the confirmation of further trials*. Dr. De Carro, in a letter

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* Annals of Medicine for 1801.

to Dr. Milne at Bushire, dated 27th July, 1803, informs him, that Dr. Lafont at Salonica had also succeeded in producing the vaccine disease from grease. The paragraph is as follows :

“ A French Physician, established at Salonica in Macedonia, Dr. Lafont, has been very successful with his experiments on the grease. He has produced the cow-pox with the matter of that disease of horses. Farriers of that country know it perfectly well, and what is very remarkable, they distinguish three species of it, the Phlegmonous, the Scrophulous, and the Variolous. It was the last species that produced the cow-pox on children; the two former, when inoculated, have occasioned much fever; but the latter hath produced the disease as mild as usually. The distinction of the grease appears to me very nice, and shews more medical and veterinary knowledge than one would expect from a country where arts and sciences are not now in a flourishing state. The horse from which Dr. Lafont took his matter had four little ulcers on the heels, legs and breast, and an eruption of pimples much similar to the small-pox. This phenomenon seems to give some weight to my hypothesis, of the origin of the small-pox being derived from some variety of the grease.”

Whatever faith medical men may choose to place on these experiments, and whatever may be their
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opinion respecting Dr. De Carro's hypothesis, of the origin of small-pox being derived from some variety of grease, the relation of them is a sufficient incitement to the institution of farther enquiries and experiments on so curious and interesting a subject. To this object some part of my attention shall be devoted, between this time and that at which I may have the honor to present a second Report to the Board.

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SECTION VI.

OF THE SMALL-POX IN BENGAL, AND OF SMALL-POX
INOCULATION AS PRACTISED BY THE BRAMINS.

THE small-pox has not prevailed, epidemically, in Calcutta and its neighbourhood, since the introduction of vaccine inoculation, owing, I have no doubt, to the judicious prohibition of variolous inoculation by the police, ever since that time. A few sporadic cases have, however, made their appearance. From one of these I performed my test experiments last year, as already related; and, as I was anxious to repeat them this season, I have enquired for others, but without success; though my Bramin informs me, that a few natives have taken the disease naturally and died of it; and that some of the better sort of Hindoos have had variolous inoculation performed clandestinely upon persons of their own families.

Some time in January my Bramin came to me with marks of great disappointment and concern in his countenance, and told me, that a boy who had been vaccinated last November had lately been seized with small-pox, and that he had seen him that day with a very full eruption of them all over his body. I immediately turned to my register, and found that even if the alledged fact were true it could not affect the character

racter of vaccine inoculation, because opposite to the name of the boy was the mark of doubtful success; and, as he had not returned for subsequent examination, it could not be said whether he had been duly vaccinated or not. However, to satisfy myself of the truth of the allegation, I accompanied the Bramin to the house of the supposed small-pox patient, and found him indeed very fully covered with an eruption, but so obviously the chicken-pox, which has been very prevalent for the last two months, that I wonder how the Bramin could have been mistaken. I have been particular in stating this circumstance, in the first place, to shew that there would be no backwardness in bringing forward any fact to the discredit of vaccine inoculation, if any such existed; and in the next, to prove how little these people really know about the diseases they pretend to treat; for here was a man who had been occupied all his life in the business of inoculating small pox, so entirely ignorant of the true nature of that disease, as to mistake the chicken-pox for it. If matter had been wanted for small-pox inoculation, he would of course have had no hesitation in producing the contents of these pustules as variolous virus. The child so inoculated would have had a local affection, and probably some pustules; which being believed to be a sufficient inoculation, the child on subsequent exposure to small-pox contagion, which no care would be taken to prevent, would catch the disease, and probably die:—a lamentable accident which has actually happened in several instances,

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both in this country and in Europe ; owing, I have no doubt, to a mistake committed in the kind of matter employed in inoculation. I mean also, from the circumstance above related, to deduce an argument against soon committing the vaccine disease to the management of natives, at any distance from immediate European superintendence. I have great doubts of their capacity to keep it up in a genuine state, if they were willing ;* and none at all of their possessing cunning enough to vitiate it on purpose, in order to bring it into discredit and disuse. Several of them have come to me, requesting matter to inoculate with. I have given them every encouragement, but have always told them to bring a few children to me, in the first place, to be inoculated, in order that they might learn how to perform the operation, and how to distinguish and preserve the genuine disease. They have gone away under a promise to return the next inoculation day, but I have never seen one of them a second time. Such conduct on the part of the Bramin inoculators, I apprehend, I am warranted in saying, looks extremely like sinister design.

In the spirit of mistaken humanity, it may appear to some, that it is hard upon the inoculators to prohibit the exercise of an art by which so many individuals gain a livelihood. This at first sight seems plausible, but when it is considered how easily they might compensate

* See extract from Mr. Mason's letter in the Report.

pensate to themselves this temporary suspension of emolument, by shewing a proper disposition to the adoption of the vaccine instead of the variolous inoculation, and which, after due instruction, they might practise for the same fees they have been accustomed to receive for inoculating small-pox; the observation, I apprehend, will fall to the ground, as far as regards humanity to the inoculators: and in a public point of view, there can be no question, between the humanity of prohibiting and permitting small-pox inoculation. In Britain, where the inoculation of small-pox and its casual occurrence formed a lucrative field of employment to the medical practitioner, no sensible and conscientious man ever thought of continuing the practice of small-pox inoculation, after that of the vaccine was fully proved to possess the qualities ascribed to it. No renumeration was ever looked for by them. They cheerfully gave up a very profitable branch of business in the contemplation of the benefit accruing to the public from the extension of this happy discovery. No such laudable and disinterested conduct can, however, be expected from an ignorant Bengalese inoculator; to whose selfish and sordid perceptions, as to those of most of his countrymen, the idea of a *public* is, I believe, totally unintelligible.

It has been proved that the public has already benefited very greatly by the police having prohibited small-pox inoculation in Calcutta, and its immediate neighbourhood. Every year anterior to 1803, the Bramins

were in the practice of introducing the small-pox into this metropolis, by inoculation, in January or February. They inoculated all who could pay them, regardless how near their patients were to those who either could not from indigence, or would not from principle be inoculated; by this means spreading on every side a fatal pestilence, which annually pursued its course of misery and death. Happily the two last inoculating seasons have passed by without bringing with them this dreadful scourge of humanity. European families have been freed from those terrors which were always created by the prevalence of the small-pox, in consequence of the carelessness of servants about introducing infection, where there were children uninoculated. Thousands of natives have been rescued from an untimely grave; and the vaccine disease has obtained subjects, on whom to demonstrate its inimitable innocence, benignity, and power; as well as to afford the means of preserving so great a blessing to this quarter of the globe. All which advantages would be inevitably and irretrievably lost, by resorting to the former system of annual and indiscriminate inoculation of the small-pox.

These observations, I trust, are sufficient to shew, that the prohibition of small-pox inoculation, though on a superficial view of the question it may appear a harsh and unconciliating measure, is in reality a regulation by which the cause of humanity is most effectually served; and which is absolutely essential to
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the very existence of the vaccine disease in this country. If any modification of the system were to be adopted, in consequence of its being impossible that the vaccine disease should immediately extend its benefits all over the country, perhaps it might not be improper to allow small-pox inoculation to be performed for a limited time in the country, but on no account, within ten miles of any large and populous town. It would there do much less mischief, because it is only in populous places that the disease can extend widely by means of contagion. And yet there may be an objection even to this modification, as a measure tending to perpetuate small-pox contagion on the earth. For if small-pox inoculation were entirely, and in every part of the world discontinued, the sources of variolous infection would be almost dried up, and the growing progress of the vaccine would nearly deprive it of subjects to act upon, if it should casually appear. And thus will it be called too sanguine, to hope that the small-pox may at length be finally annihilated, and its name for ever erased from the tedious catalogue of human misery?

It would be a curious subject of enquiry to endeavour to discover at what time the fatal pestilence of small-pox first appeared in Hindostan; but I am afraid the historical documents we at present possess are insufficient for the solution of the question. Mr. Holwell, who published an account of the practice of inoculation in Bengal, endeavours to make it appear that the
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disease was known in Hindostan upwards of three thousand years ago.

In one of the Bhedes, to which he assigns a date, of 3366 years before the time at which he wrote, a certain form of sacrifice and *poojah* is enjoined to be performed to the *Gootee ka Tagooran*, or goddess of spots, at the time when the small-pox usually become epidemic; and from hence he concludes, that the small-pox must have been known at the time those scriptures were written. But, independently of the reliance here placed upon Hindoo Chronology: upon the *Gootee ka Tagooran* being the divinity of all other eruptive diseases, as well as of the small-pox; and upon our having no description of the disease by which we can ascertain it to be the same; Doctor Woodville, from the consideration of certain circumstances renders it extremely improbable, that the disease should have existed for so great a length of time in Hindostan without being conveyed to other parts of the world. The small-pox is not a disease to remain stationary in any particular region. Its ravages, since it was first known to Europe, have never failed to follow close upon the heels of adventure, war and commerce. If it had prevailed in India at the time of Alexander's invasion, is it credible that his immense army could have escaped it? Or that, at a later period, it would not have found its way to Rome, by means of the commerce established between India and that capital of the world, by the way of Alexandria? That neither of these things happened, I agree with

with Dr. Woodville in thinking almost certain, from the utter silence of all the ancient Greek and Roman physicians on the subject ; and even of Galen, who studied physic at Alexandria so late as the second century of the Christian æra ; and would undoubtedly have noticed the disease, had it prevailed in that city, or been known to his contemporaries during his stay there. It is therefore most probable that the disease was unknown in India till after its appearance in Arabia, which the best authorities state to have happened at the siege of Mecca, correspondent with the æra of the birth of Mahomed, fixed by Mr. Gibbon to the year 569 ; and the principal commerce of the east being then carried on by the Arabians, it could not be long before the disease made its way to all parts of Asia.

At what time, or in what part of the world inoculation for the small pox was first practised, seems to be wholly unknown. Vague report says, in Circassia, but the assertion is supported by no authority. The western parts of Europe certainly obtained it from Constantinople, where, however, it had not been known half a century. In China, and in Hindostan, or more properly Bengal, it is believed to be an immemorial custom ; but the different manner of performing the operation in the two countries renders it improbable that the practice could have been adopted from a common origin. In China, they introduce into the nostrils, plugs charged with variolus virus ; in Bengal, they inoculate the legs or arms. Mr. Holwell has given a full account of the practice

practice of the Bramins, which, as it agrees pretty closely with what I have myself seen, and heard from different parts of the country, I shall here beg leave to transcribe.

“Inoculation is performed in Hindostan by a particular tribe of Bramins, who are delegated annually for this service, from the different colleges of Bindoobund, Eleabas, Benares, &c. over all the distant provinces. Dividing themselves into small parties of three or four each, they plan their travelling circuits in such wise as to arrive at the places of their respective destination some weeks before the usual return of the disease. They arrive commonly in the Bengal provinces early in February; although, in some years, they do not begin to inoculate before March, deferring it until they consider the state of the season, and acquire information of the state of the distemper. The inhabitants of Bengal, knowing the usual time when the inoculating Bramins annually return, observe strictly the regimen enjoined, whether they determine to be inoculated or not; this preparation consists only in abstaining for a month from fish, milk, and ghee (a kind of butter made generally of buffalo’s milk.) The prohibition of fish respects only the native Portuguese and Mahomedans, who abound in every province of the empire. When the Bramins begin to inoculate, they pass from house to house, and operate at the door, refusing to inoculate any who have not, on a strict scrutiny, duly observed the preparatory course enjoined them. It is no uncommon thing for
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them to ask the parents how many pocks they choose the children should have. Vanity, we should think, urged a question on a matter seemingly so uncertain in the issue ; but true it is, that they hardly ever exceed or are deficient in the number required. They inoculate indifferently on any part ; but if left to their choice they prefer the outside of the arm, midway between the wrist and the elbow, and the shoulders for the females. Previous to the operation, the operator takes a piece of cloth in his hand (which becomes his perquisite if the family is opulent,) and with it gives a dry friction on the part intended for inoculation, for the space of eight or ten minutes ; then, with a small instrument he wounds by many slight touches, about the compass of a silver groat, just making the smallest appearance of blood. Then opening a linen double rag, (which he always keeps in a cloth round his waist,) he takes from thence a small pledget of cotton charged with the variolous matter, which he moistens with two or three drops of the Ganges water, and applies it to the wound, fixing it on with a slight bandage, and ordering it to remain on for six hours without being moved ; then the bandage to be taken off, and the pledget to remain until it falls off itself.

“ The cotton, which he preserves in a double callico rag, is saturated with matter from the inoculated pustules of the preceding year ; for they never inoculate with fresh matter, nor with matter from the disease caught in the natural way, however distinct and mild
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the species. Early in the morning succeeding the operation, four collons (an earthen pot containing about two gallons) of cold water are ordered to be thrown over the patient from the head downwards, and to be repeated every morning and evening until the fever comes on, which usually is about the close of the sixth day from the inoculation, then to desist until the appearance of the eruption (about three days;) and then to pursue the cold bathing, as before, through the course of the disease, and until the scabs of the pustules drop off. They are ordered to open all the pustules with a sharp pointed thorn as soon as they begin to change their colour, and whilst the matter continues in a fluid state.

Confinement to the house is absolutely forbid, and the inoculated are ordered to be exposed to every air that blows; and the utmost indulgence they are allowed, when the fever comes on, is to be laid upon a mat at the door. But in fact the eruptive fever is generally so inconsiderable and trifling as very seldom to require this indulgence. Their regimen is ordered to consist of all the refrigerating things the climate and season produces; as plaintains, sugar-canes, water-melons, rice, gruel made of white poppy seeds, and cold water or thin rice gruel for their ordinary drink. These instructions being given, and an injunction laid on the patients to make a thanksgiving *poojah*, or offering to the Goddess on their recovery; the operator takes his fee, which from the poor is a *pun of cowries*, equal to about one penny sterling, and goes on to another door,

door, down one side of the street, and up on the other, and is thus employed from morning till night, inoculating sometimes eight or ten in a house."

The preceding account by Mr. Holwell, written, I suppose, about the middle of last century, agrees, in general pretty nearly, with the state of small-pox inoculation by the Bramins at the present period; though in some districts I have learnt that it is not the Bramins who inoculate, but people of the lowest cast. This, I am informed by Mr. Glas is the case in the zillah of Boglepore.

At what time, or from whence, the practice of small-pox inoculation was first introduced into Bengal, is equally unknown with the early history of the disease itself in India. The Hindoos of course make it a matter of incredible antiquity. But if one may reason from circumstances, it appears to me to be very questionable, whether it has been known here much longer than in England. The practice of small-pox inoculation on this side of India is confined almost exclusively to Bengal. About the year 1765, a gentleman at Patna, who was desirous of giving some account of it to a correspondent in Europe, could find no one in Behar who knew any thing of the matter, and was obliged to derive his information from a Bengalese inoculator. Even at this day it is not practised in Oude, or the Dooab; and at Allahabad, (the city designated by Mr. Holwell under the name of Eleabas, as the head quarters of one body

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of inoculators) though it is now known to the natives, it is but little used ; and always by Bramins from Behar and Bengal. In Napaul, on the northern frontier of the British dominions, it is altogether unknown, and equally so at Nagpore, Hyderabad and Mysore. Is it probable that so easy a method of ameliorating a fatal disease would have made so little progress, if it had been long known in Bengal ? I might even ask, is it probable that such an improvement in medicine would have escaped the notice of our medical men, belonging to ships, and settled in factories, (such men as Broughton and Hamilton, for instance) in the end of the seventeenth, and beginning of the eighteenth century, had the practice been in their days common in Bengal ? And should we not then have been indebted to Bengal, rather than to Turkey, for so easy a method of saving human life ? These are questions which it is not easy at present to answer, and which I am aware, it may be said, it is, in this place, unnecessary to ask. The subject, however, appears to me, to be curious and interesting in the history of medical improvement ; and as such, I shall probably take a future opportunity of resuming it, better prepared for the discussion. In the mean time I may conclude this article by remarking, that the Bramin inoculators are not now so moderate in their charges, as they were in Mr. Holwell's time : at least this is true in and about Calcutta ; and that, instead of waiting for the disease to break out spontaneously, which it probably would not do above once in ten or fifteen years, they commence their operations at a certain time every year ;

and

and thus artificially produce an epidemic, which by its frequent recurrence, proves much more destructive to the community than if inoculation had been entirely abolished, and the casual disease left to the chance of appearing at the distant periods above mentioned.

SECTION

SECTION VII.

MISCELLANEOUS OBSERVATIONS ON THE VACCINE DISEASE IN BENGAL, WHICH HAVE EITHER BEEN OMITTED, OR DO NOT RANGE THEMSELVES NATURALLY UNDER ANY OF THE FOREGOING HEADS.

ON comparing what was done in England in the first year of vaccine inoculation with the preceding report, which includes very little more than one year, the result will, it is hoped, appear not unfavorable to the practice in Bengal.

In England four thousand persons only were inoculated during the first year : in our register we enumerate at least eleven thousand.

At the vaccine institution in London, established principally for the purpose of making observations on the disease, and preserving a source of genuine virus, 1202 only were inoculated during the first three years : in Bengal, with views exactly similar, and I trust, not less fully accomplished, three of the vaccine stations, which may be compared to as many vaccine institutions, and one of the subordinate stations, exhibit a greater number of patients in one year than the London institution does in three.

We

We have kept regular registers of cases, scarcely differing in form, and not at all in substance, from those described by Dr. Pearson.

We have avoided entirely the production of those anomalous cases, which were so perplexing to practitioners at home, and so injurious to the fame of the new practice, in the early period of vaccination.

A few cases with pustules have been seen, but so rarely, as to deserve no notice in the enumeration of the appearances of the disease. I have myself seen only two cases of pustules, and in each of them only a single pustule; in one on the chin, and in the other within the circle of the areola: except in cases of itch, where the child first scratching the vaccine pustule, and then the itchy pimples, certainly does communicate to them a vaccine action and pustular appearance, ending often in ulcerous sores. Itch, however, forms no objection to the vaccine inoculation, farther than as the child will generally destroy the pustule by scratching, such subjects should be avoided when we wish to preserve a supply of matter. If the eruptions are near the eyes, however, it would be better not to inoculate at all until they are cured, as in one case under the care of Dr. De Carro, the scratching of such eruptions with fingers embued with vaccine matter produced so much inflammation as to occasion very serious alarm for the loss of sight.

No

No fatal or troublesome accident whatever has occurred during our vaccine practice, that can be imputed to the inoculation ; nor do I believe any such accident can occur from vaccination simply. One child at Dacca, who had been inoculated with vaccine fluid was seized with the natural small-pox before the vaccine inoculation had arrived at maturity, and died : * but this is nothing more than would have happened if the child had not been vaccinated ; and though such a disaster would no doubt militate against vaccine inoculation among the ignorant, it is perfectly capable of being explained in a satisfactory manner to any unprejudiced person of common understanding.

We have inoculated at all ages, from one month to fifty years old, without the smallest inconvenience. Teething forms no obstacle, and we have had no bad arms requiring surgical treatment.

We have inoculated during the hooping cough without any obvious effect on either disease.

The chicken pox has occurred during vaccination, and pursued its course uninterruptedly, and the measles soon afterwards in its usual form.

Some have observed a kind of eruption of red pimples, and sometimes of little elevated spots with minute horny points, (which I at first considered as vaccinated musquito's

*See Mr. Tutin's Letter, No. 7.

musquito's bites,) in two or three weeks after vaccination; but these are harmless, and as children in this climate are particularly obnoxious to cutaneous eruptions, it may be doubted whether they at all depend on vaccination.

What power the vaccine disease may have over the constitution, so as to render it unsusceptible to the future effects of other fatal diseases besides small pox, cannot yet be determined. It was at one time believed that vaccination would be found a preventive of the rot in sheep; but subsequent experiments have proved that those animals are not susceptible of vaccine infection; though the matter of rot itself inoculated upon them is found to diminish the mortality of the disease, in the manner that variolous inoculation lessens the number of deaths from small-pox.

Dr. De Carro, who is ever upon the alert in any thing that concerns vaccination, entertains hopes that it may be found a preservative against the plague.

After what has been done by the vaccine disease, it would be rash to say what may not be done. At the same time it occurs to recollection, that the plague is a disease which may be received more than once, and that if it does not prevent its own return, it is not very likely that another disease should possess such a power. Future experiments, however, must determine the
point

point; for certainly, to the generality of medical men, nothing could have appeared more improbable five years ago, than that so simple and efficacious a remedy would ever be discovered against the ravages of small pox, more fatal than the plague itself.

An ingenious medical gentleman of Calcutta suggested a few days ago the application of vaccine matter to a very bad cancerous sore on the nose and face, which had for some years resisted all the remedies that could be devised. The sore had approached very near to both eyes, and the trial was there fore opposed from fear of doing irreparable injury to them, on the authority of the case quoted above from Dr. De Carro.

As the patient was an adult and had had the small-pox, it was by no means certain that any vaccine action would have taken place; however, the risk was thought too great, and the experiment was, consequently abandoned. In almost any other part, the proposal might have been adopted with safety; and whenever such a case occurs to me, I shall certainly give it a fair trial in cancer, as well as in other sores difficult to heal. My hopes of its effects in cancer, I confess, are not sanguine; but in so deplorable a malady what is there that one would not try?

(Signed)

J. SHOOLBRED

P. S. Since writing the former part of this Appendix, it is with much concern that I have observed failures in inoculating with recent fluid matter to have become much more frequent with the increased heat of the weather.* On one of my inoculating days, I have been a second time reduced to a single pustule as the only source of infection for that day's operations. Had this pustule been destroyed, I should not, however, have lost the virus, because having two inoculating days in the week, I had still in the earlier stage of the disease a reserve of seven or eight patients to supply matter on my next inoculating day. I mention the circumstance however, to show how very delicate a thing the vaccine virus is ; and how much care and circumspection

* The same observation has been made in the West Indies, where the disease has been repeatedly lost, in consequence of the heat of the climate ; a circumstance which has led medical practitioners in those islands, to consider it as an established, though "lamentable fact, that in a temperature of ninety degrees, the vaccine matter loses its activity and becomes absolutely effete." (*Medical and Physical Journal*, for December, 1803.) This coincidence of observation in similar climates, is a strong confirmation of what I have said of the impaired activity of the matter in very hot weather, and affords an additional proof of the efficiency of the vaccine establishment in Bengal, which has fortunately been able to preserve the disease by successive inoculations, though the thermometer has during the last two months often exceeded one hundred degrees in the huts of the patients under vaccination.

June 9, 1804.

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cumspection will always be necessary on the part of those concerned in its preservation in this part of the world.*

TRUE COPY,

F. BALFOUR.

FORT WILLIAM.

Medical Board Office, April 19, 1804.

* Before sending the last sheet to the Press, it gives me great pleasure to announce, that accounts have been received of the vaccine disease having reached Bencoolen, in consequence of the measures adopted by Government, for that purpose, as detailed in the Report, page 24.

June 10, 1804.

JOHN

JOHN FLEMING, Esq. First Member of the Medical Board at Bengal, having obligingly favoured Messrs. Blacks and Parry with a Copy of his Letter to His Excellency the Governor General, dated 29 November, 1802, with its enclosures; and which are referred to by Mr. Shoolbred in the Report, Page 5, they are with the Permission of Mr. Fleming presented to the Public.

Fort William, Dec. 1, 1802.

The Governor-General in Council is pleased to direct, that the following letter with its inclosures, addressed by John Fleming, Esq. first Member of the Medical Board, to his Excellency in Council, be published for general information.

*To his Excellency the Marquis Wellesly, K. P.
Governor-General in Council.*

MY LORD,

IT is with the highest satisfaction I do myself the honour of acquainting your Excellency, that after repeated disappointments we have at last, through the benevolent attention of Dr. Anderson, at Madras, been so fortunate as to obtain the recent matter of the cow-

pox, and that we have thereby been enabled to introduce the practice of vaccination into this settlement. I herewith enclose the letter with which I was favoured by the Doctor on the subject, together with one which I have received from Captain Anderson, commander of the ship Hunter, whose assiduous attention to ensure success to the important commission with which he was entrusted, is very meritorious.

John Norton, the boy vaccinated by Captain Anderson on the 12th instant, arrived in Calcutta on the 17th, with such evident and decisive marks on his arm of being infected with the genuine cow-pox, as left no room for doubt or hesitation. As the matter was already ripe for communicating the infection, three children born of European parents, belonging to His Majesty's 10th Regiment, were vaccinated by Mr. William Russell on that day; and on the day following the operation was performed on eight others. Among these were two children of Mr. Barlow, one of Colonel Dyer, one of Mr. Birch, one of Mr. Trail, and one of Mr. Binny, in all of whom, as well as in the three children of the 10th Regiment, I had an opportunity of observing the progress of the infection, and from comparing the symptoms and appearances produced by it, with the minute and circumstantial descriptions given by Dr. Jenner, Mr. Atkin, and Dr. De Carro, and with the coloured plates, by which their descriptions are illustrated, I am perfectly satisfied that it was the true vaccine disease. Messrs. Russells, Hare, Shoolbred,

Shoolbred, and other Medical Gentlemen, who had an opportunity of seeing the children, are fully impressed with the same conviction. In confirmation of this important fact, I think it proper to mention, that three children who were inoculated with the thread sent me by Captain Anderson from Kedgerree, as mentioned in his letter, received the infection, and shewed, in the progress of the disease, the same characteristic symptom and appearances on the arm as those that were inoculated from Norton. The same satisfactory result was experienced in respect to two children inoculated by Mr. Shoolbred on the 20th, and two others on the 21st, from matter taken from Norton's arm on the 19th, all of whom, he assures me, exhibited in the most unequivocal manner, the distinguishing symptoms of the genuine cow-pox.

The settlement being now, as I conceive, in complete possession of the benefit derived to mankind from Dr. Jenner's celebrated discovery, I take the liberty of submitting to your Excellency's consideration, my opinion on the best mode of preserving the continuance of so great a blessing, and spreading it as rapidly as possible throughout the provinces.

For attaining the first of these important objects, I would recommend that a Surgeon of approved skill and assiduity, should be appointed to the charge of preserving a constant supply of recent genuine matter, for the use of the metropolis and the subordinate stations ;

tions; and that it should be a part of his duty not only to vaccinate the children of such of the Natives as might apply to him, but also to take every opportunity to instruct the Hindoo and Mahomedan Physicians in the proper mode of performing the operation, and to give them precise and clear information respecting those symptoms and appearances by which the specific genuine cow-pox may be distinguished from other eruptions.

To facilitate the general adoption of the practice of vaccination by the Natives, I beg leave to suggest, that a notification should be published in the Persian, Hindavy, and Bengalese languages, and also in the Sanscrit, giving

1. A succinct History of the discovery, in which the curious, and to the Hindoos, very interesting circumstance that this wonderful preventive was originally procured from the body of the cow should be emphatically remarked.
2. An explanation of the important, and essential advantages which vaccination possesses over the small-pox inoculation, and

Lastly, an earnest exhortation to the Natives of these provinces to lose no time in availing themselves of
this

this enestimable benefit, scarcely inferior to any that ever was communicated by one nation to another.

I have the honour to be,

With the greatest respect,

My Lord,

Your Excellency's most obedient

Humble Servant,

JOHN FLEMING.

First Member of the Medical Board.

Calcutta, November 29, 1802.

(COPY.)

Fort St. George, Oct. 11, 1802.

DEAR SIR,

Not having heard of the Bombay Cow-pox matter succeeding in Bengal, I take the opportunity of the ship Hunter sailing, to inoculate two boys born of European parents at Botany Bay (where the small-pox has never appeared) belonging to the ship, by whom Captain Anderson, the commander, hopes of being able to continue the disease in succession until his arrival at Calcutta.

The matter with which these two boys have been inoculated, was taken last night from the arm of a
healthy

healthy child inoculated at Chingleput on the 1st instant, with threads sent on the 9th ultimo from Trincomallee by Mr. Rogers, the disease appears to all here to be of the genuine kind; and confident of your attention to promote the benefit of this invaluable discovery,

I am very truly yours,

JAMES ANDERSON.

(Signed)

JOHN FLEMING, ESQ.

Calcutta.

(COPY.)

JOHN FLEMING, *Esq.*

SIR,

Agreeably to your desire, I have the pleasure of sending you the following memorandums, respecting the persons inoculated for the cow-pox during my passage from Madras.

John Cresswell, a boy born at Port Jackson, of European parents, aged about thirteen years, was inoculated at Dr. Anderson's house at Madras, on the 10th of October, from a native child who had arrived that day from Chingleput. As the disease made its appearance rather late, and afterwards advanced very slowly, I did not take matter from him till the 22d ultimo, when I inoculated M. A. an European child, aged eighteen

teen months. From her I inoculated Harry, a Malay boy, aged about seven years, on the 2d of November; and on the 12th, Charles Norton, a boy born at Port Jackson of European parents, aged about fifteen years, was inoculated from Harry. The disease having made its appearance in due time, as soon as the ship arrived at Diamond Harbour, I sent him to town, where he arrived on the 19th instant, and was disposed of as you directed.

The cotton threads which I sent you from Kedge-ree, were strongly impregnated with vaccine matter taken from the European child and the Malay boy, on the 2d and 12th instant, as particularly marked on each.

I have the honor to be,

SIR,

Your most obedient humble Servant,

(Signed) WM. ANDERSON.

Calcutta, November 27, 1802.

The Governor General in Council is pleased to order :

1st.—That the high approbation of His Excellency in Council be signified to Dr. James Anderson, Physician General and First Member of the Hospital Board

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upon the Establishment of Fort St. George, for the benevolent attention, assiduity, and skill, manifested by him in promoting the introduction into these provinces, of the benefit of the valuable and important discovery made by Dr. Jenner, and that this order be transmitted to the Right Honorable the Governor in Council of Fort St. George, for the purpose of being duly signified to Dr. Anderson.

2d.—That the Chief Secretary do signify to Captain Anderson, Commander of the ship Hunter, the thanks of the Governor General in Council, for his assiduons attention in insuring the success of the important commission with which he was entrusted.

3d.—That the Chief Secretary do signify the approbation of the Governor General in Council to John Fleming, Esq. and to Messrs. Russells, Hare, and Shoolbred, and the other Medical Gentlemen, employed in this important occasion, for their diligence and ability, in promoting at this Presidency the successful introduction of Dr. Jenner's discovery.

4th.—That Mr. William Russell be appointed to superintend the further promotion of the benefits of Dr. Jenner's discovery throughout the provinces subject to the immediate Government of this Presidency.

5th.

5th.—That a notification be prepared and published in the Persian, Hindavy, Bengalese and Shanscrit languages, according to the suggestion of Mr. Fleming.

BY COMMAND OF HIS EXCELLENCY,

The most noble the Governor General in Council,

J. LUMSDEN,

Chief Secretary to the Government.

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